## ABSTRACT OF THE DISCLOSURE

Apparatus and method for molding a tire (110) with an expandable bead molding ring assembly (250) having a two-stage movement from a retracted and disengaged state, to a radially expanded state, to an expanded and engaged state for molding a tire bead (112b). The two-stage movement is accomplished using a simple assembly of easily manufactured parts, and is driven by a simple continuous downward (axially outward) movement (320) of a hub (209) of a mold press (220). A combination of annular elements with springs converts the hub movement to the desired two-stage movement of segments (254, 256) of a segmented bead molding ring (252). Frustraconical cam surfaces (258, 266) are used to divide axially directed forces (420a, 420b) from the mold press movement (320) into radial force components (410a, 410b) and axial force components (415a, 415b) for causing corresponding radial movements (310) and axial movements (315) during the two stage movement. Spring resistances are balanced, and stopping surfaces are provided in order to control and properly sequence the two-stage movement. The elements of the expandable bead molding ring assembly are preferably assembled with a sidewall mold to form a single unit (280) that is easily maintained and easily switched in and out of the mold press for mold changeover to adapt to different profiles to be molded on beads of different tire constructions.